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REVIEW

"THE PHYLOGENY AND CLASSIFICATION OF THE FERNS," edited by A. C. Jermy, J. A. Crabbe, and B. A. Thomas. xiv + 284 pp. 1973. Academic Press, London and New York. 9.00 pounds; $25.00.—This volume is a pteridological banquet, albeit an expensive one. The fare is generally good, or at least provocative, although I must confess that some of the phylogenetic speculation left me with indigestion. The book is the outgrowth of a symposium held in London in 1972 and jointly sponsored by the British Pteridological Society and the Linnaean Society of London. Individual papers fall about equally into two categories: review articles and articles presenting new research and ideas on specific groups. The latter are of most interest to me, while the former are likely to be more appreciated by a general audience.

It is fitting that this volume begins with an address by R. E. Holttum, who perhaps has had more influence on fern systematics than anyone else in the past 25 years. In a penetrating statement on the causes of our difficulties as taxonomists, Holttum reminds us that human limitations and imperfect communication are often the chief roadblocks to advancing taxonomy. Pichi Sermolli, in a lavishly illustrated paper, then painstakingly reviews the incremental changes in fern classification since the beginning of taxonomic time. There follow papers by Van Cotthem (stomatal patterns), Atkinson (gametophytes), Swain and Cooper-Driver (biochemistry), and T. Walker (cytology) assessing the application of their respective specialties to taxonomy of ferns. Walker also includes several new and intriguing chromosome reports while focusing on where cytology is most likely to produce added insight into taxonomic problems. Bierhorst expands upon his theory of the origin of the fern leaf, using as examples the non-appendicular fronds of his favorite organisms, *Stromatopteris* and *Psilotum*, as well as several other "primitive" genera. There is a short, almost perfunctory paper by Harris on fossil ferns. One gets the impression that there is either little to add to the subject since publication of an earlier symposium on the origin and evolution of ferns (Mem. Torrey Bot. Club **21**(5):1-95. 1964) or that there is a distressing lack of communication between pteridologists and paleobotanists (need they be mutually exclusive?), a state of affairs hinted by Manton in her closing address.

The coverage of individual groups of ferns is necessarily incomplete but broad. Mickel tackles the dennstaedtioid ferns but comes up nearly empty-handed, concluding that we don't yet know enough to assess their relationships. Working from a broader data base, Holttum offers his views on the origin of the thelypteroid ferns and suggests possible cyatheoid ancestry. His analysis was possible only after extensive monographic work that he himself conducted on Old World

Thelypteridaceae. Herein lies to me the most important lesson of this symposium volume: phylogenists are largely at an impasse until modern monographic treatments are available for critical groups. This is especially necessary for the evolutionarily pivotal dennstaedtioid ferns, as Mickel and Holttum state. Reasons for the paucity of recent monographs are not discussed, but need to be. The principal reasons seem to be funding priorities and the incompatibility of the publish-or-perish cloud under which most monographers must work and the time required for successful completion of monographs.

Two of the more interesting and stimulating papers, not on the original program but happily inserted into the symposium volume, deal with spore morphology in cheilanthoid and thelypteroid ferns, by Tryon and Tryon and by Wood, respectively. Both surveys utilize the scanning electron microscope and suggest insights into classification of these groups. Undoubtedly there will be a proliferation of such surveys in the near future, it is to be hoped in a taxonomic context such as these two.

Familial boundaries of Aspidiaceae and Davalliaceae are examined by Sledge and by Sen and Sen, respectively. Sledge concludes that there is no justification for recognizing Athyriaceae as a separate family, while Sen and Sen advise against splitting off Oleandraceae from the Davalliaceae. The latters' arguments and conclusions, based on anatomical evidence from seven species in three genera, are, however, a little like deciding that Leguminosae is a good family after examining only *Mimosa, Pisum,* and *Caesalpinia*. Assignment of family rank has always been and will probably continue to be a subjective decision, arrived at by noting rank assigned to related groups. The important point is to be able to say that genera within Davalliaceae *s. l.* are more closely related to each other than to anything else, a point for which Sen and Sen do have good evidence.

There are two new phylogenies (Holttum, Mickel) and one new classification (Wagner) presented by contributors. Differences among these schemes are more striking than similarities. These schemes are offered primarily as reference points for discussion and for the purpose of testing hypotheses and promoting additional insight into relationships. Those who would rush to adopt one of these should recognize that there is no unanimity among pteridologists with regard to classification and phylogeny of ferns. There does seem to be a growing feeling that schizaeoid ferns gave rise to the gymnogrammoid–cheilanthoid line, and that Ophioglossaceae and Marattiaceae have little to do with each other or with leptosporangiate ferns. We are left with several "mini" evolutionary lines, truncated at their bases. This may be less picturesque, but it is more honest, in view of how little is known about the ancestry of ferns.

The volume is well-edited, with pleasing typography and good photographic reproduction. The editors have provided an index and cross-indexing. One regrets that it was not possible to capture in the book some of the undoubtedly lively discussion following some of the papers. This would have provided an appropriate dessert.—*Alan R. Smith, Herbarium, Dept. of Botany, University of California, Berkeley, CA 94720.*